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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/047,150	01/14/2002	Armin Schoppach	(Z) 99038 P US	4347

7590 05/16/2005
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EXAMINER

PRITCHETT, JOSHUA L

ART UNIT	PAPER NUMBER
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2872

DATE MAILED: 05/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/047,150	Applicant(s) SCHOPPACH ET AL.	
	Examiner Joshua L. Pritchett	Art Unit 2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 20-42 is/are pending in the application.
- 4a) Of the above claim(s) 28-35 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 20-27 and 36-42 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>3/05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This action is in response to Amendment filed March 14, 2005. Claims 36-42 have been added as requested by the applicant.

Information Disclosure Statement

The information disclosure statement filed March 2005 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered. There is no copy of "High stability Carbon/Carbon Telescope Structure" with the IDS.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hull (US 6,404,547) in view of Herbst (US 5,663,563).

Regarding claim 20, Hull teaches an optical system with a first optical element (13) having a focal point and a further optical element (14), the first optical element and the second optical element being arranged at a predetermined distance from each other (col. 4 lines 7-9) by means of a mounting (17 and 18). Hull further teaches the mountings (18) comprise compensation elements (17) allowing a change from the predetermined distance between the first optical element and the second optical element (col. 4 lines 41-43). Hull teaches the compensation elements being made of metal (col. 6 lines 49-50). Hull further teaches the movement of the optical element based on temperature dependence (col. 4 lines 20-42). Hull lacks reference to the compensating elements being made from a material so as to displace the first optical element in a same amount of displacement of the focal point occurs because of heating. Herbst teaches the compensating elements being made from a material so as to displace the first optical element in a same amount of displacement of the focal point occurs because of heating (col. 1 lines 54-57). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the compensating elements of Hull be made from a material to perform the function as taught by Herbst for the purpose of the optical system producing an image that is in focus regardless of the ambient temperature.

Regarding claim 21, Hull teaches at least one of the first and a further optical element comprises a lens (Fig. 1).

Regarding claim 38, Hull teaches the compensating elements are connected on one side with the mounting and on the other side with the mirror mounting (Fig. 1a).

Regarding claim 39, Hull teaches the compensating elements are connected on one side with the mounting and on the other side with the mirror member (Fig. 1a).

Claims 22, 23, 36 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hull (US 6,404,547) in view of Herbst (US 5,663,563) as applied to claim 20 above, and further in view of Fruit ("A New Concept in Telescope Design SiC as the Only Material for Mirrors and Structure").

Hull in combination with Herbst teaches the invention as claimed but lacks reference to the use of a mounting material with the claimed composition. Fruit teaches the use of SiC with a density of at least $2.5 \times 10^3 \text{ kg/m}^3$ to construct the mounting means of a telescope (Fig. 1). Once the Hull mounting means (18) is made of the Fruit material (Fruit teaches the structure made of C/C SiC; page 2 section 3.1) the compensation elements (17) and the mounting means (18) will inherently have different thermal expansion coefficients because they are made of different materials. Fruit further teaches the optical system used in orbit (page 2). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the Hull mounting means made of the Fruit material for the purpose of allowing the telescope to be lightweight and therefore portable without losing strength in the mountings.

Claims 24, 25, 27 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hull (US 6,404,547) in view of Herbst (US 5,663,563) and Jutte (US 4,098,476).

Regarding claims 24 and 27, Hull teaches an optical system with a first optical element (13) having a focal point and a further optical element (14), the first optical element and the

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second optical element being arranged at a predetermined distance from each other (col. 4 lines 7-9) by means of a mounting (17 and 18). Hull further teaches the mountings (18) comprise compensation elements (17) allowing a change from the predetermined distance between the first optical element and the second optical element (col. 4 lines 41-43). Hull teaches the compensation elements being made of metal (col. 6 lines 49-50). Hull further teaches the movement of the optical element based on temperature dependence (col. 4 lines 20-42). Hull lacks reference to the compensating elements being made from a material so as to displace the first optical element in a same amount of displacement of the focal point occurs because of heating. Hull further lacks reference to titanium compensation elements. Herbst teaches the compensating elements being made to displace the first optical element in a same amount of displacement of the focal point occurs because of heating (col. 1 lines 54-57). Jutte teaches the use of titanium supports to use thermal expansion to control the position of a mirror (col. 1 lines 62-68). Once the compensating elements of Hull are made from titanium as taught by Jutte the compensating elements and the mounting will inherently have different thermal expansions because they are made from different materials. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the compensating elements of Hull be made from titanium as taught by Jutte to perform the function as taught by Herbst for the purpose of the optical system producing an image that is in focus regardless of the ambient temperature.

Regarding claim 25, Hull teaches at least one of the optical elements comprising a lens (11, col. 4 lines 7-9).

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Regarding claim 41, Hull in combination with Herbst teaches the invention as claimed but lacks reference to the use of quartz or titanium. It is extremely well known in the art to use quartz as a mirror surface. Official Notice is taken. Jutte teaches the use of titanium to construct the compensation elements (col. 1 lines 62-68). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the Hull telescope include a quartz mirror as is known in the art and titanium compensation elements as taught by Jutte for the purpose of creating a telescope that can withstand a high magnitude of stress.

Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hull (US 6,404,547) in view of Herbst (US 5,663,563) and Jutte (US 4,098,476) as applied to claim 24 above, and further in view of Fruit ("A New Concept in Telescope Design SiC as the Only Material for Mirrors and Structure").

Hull in combination with Herbst and Jutte teaches the invention as claimed but lacks reference to the use of a mounting material with the claimed composition. Fruit teaches the use of SiC with a density of at least $2.5 \times 10^3 \text{ kg/m}^3$ to construct the mounting means of a telescope (page 4 col. 1). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the Hull mounting means made of the Fruit material for the purpose of allowing the telescope to be lightweight and therefore portable without losing strength in the mountings.

Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hull (US 6,404,547) in view of Herbst (US 5,663,563) and Neil (US 5,579,333).

Hull in combination with Herbst teaches the invention as claimed but lacks reference to a SiN mirror. Neil teaches the use of a SiN mirror (abstract). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the Hull invention include a SiN mirror as taught by Neil for the purpose of efficiently reflecting the light incident the mirror.

Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hull (US 6,404,547) in view of Herbst (US 5,663,563), Neil (US 5,579,333), Fruit ("A New Concept in Telescope Design SiC as the Only Material for Mirrors and Structure").

Hull in combination with Herbst teaches the invention as claimed but lacks reference to a SiN mirror and aluminum compensation elements. Neil teaches the use of a SiN mirror (abstract). Fruit teaches the use of aluminum compensation elements (page 2). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the Hull invention include a SiN mirror as taught by Neil for the purpose of efficiently reflecting the light incident the mirror. It would further have been obvious to one of ordinary skill in the art at the time the invention was made to have the Hull invention include aluminum compensation elements for the purpose of provide a light and resilient compensation element.

Response to Arguments

Applicant's arguments filed March 14, 2005 have been fully considered but they are not persuasive.

On page 8 of Amendment, applicant argues that Herbst teaches away from compensation elements and therefore would not be properly combined with Hull. Herbst acknowledges the use of compensation elements but states that compensation elements can be costly and opts a different method of optical compensation. Both Hull and Herbst are involved in the same field of endeavor and both recognize the necessity for optical compensation for temperature fluctuations. The fact that Herbst's solution is different than Hull does not mean that the teachings of the two references would not be properly combined to form an obvious variation.

On page 8 of Amendment, applicant argues that Hull teaches support struts with heating elements arranged far from the primary mirror. The claim limitation states, "compensating elements arranged in a region of the first optical element." In the broadest reasonable interpretation of "in a region" the examiner holds that the Hull invention meets the claimed limitations.

On page 8 of Amendment, applicant argues that Hull system is an active system and that a passive system is needed to function in orbit for years. There are no claim limitations that require a passive system or any specific time line for the optical device to function in orbit.

On page 9 of Amendment, applicant argues that the Hull reference fails to teach a lens in the input window. Fig. 1 shows an opening between temperature sensors (24). The opening appears to be solid and transmit light. The examiner interprets this element as a lens.

Applicant's arguments, see Amendment, filed March 14, 2005, with respect to the rejection(s) of claim(s) 22 and 26 under Harnisch have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new

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ground(s) of rejection is made in view of Fruit. On page 9 of Amendment, applicant argues that Harnisch fails to teach the claimed density of the mounting means. Applicant agrees however, newly provided reference Fruit teaches the use of a material with the claimed density.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joshua L. Pritchett whose telephone number is 571-272-2318. The examiner can normally be reached on Monday - Friday 7:00 - 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew A. Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JLP 


DREW A. DUNN
SUPERVISORY PATENT EXAMINER